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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/026,019

12/20/2001

Ralph H. Johnson

15436.436.3

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11/18/2004

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EXAMINER

NGUYEN, DUNG T

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/026,019

Applicant(s)

JOHNSON, RALPH H.

Examiner

Dung (Michael) T Nguyen

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30, 32 and 33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30, 32 and 33 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/08/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-30 and 32-33 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claim 8 is objected to because of the following informalities: it is not clear that claim 8 is depended on. Appropriate correction is required.

Double Patenting

Claims 4 and 19-20 objected to under 37 CFR 1.75 as being a substantial duplicate of claims 3, 5, and 9. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5-7, 14, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Jewell et al. (US6359920).

With respect to claim 1, Jewell disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (col.6, l.60-61) and including barrier layers (col.25, l.64-65) sandwiching said at least one quantum well; and confinement layers (col.33, l.16 and col.34, l.43) sandwiching said active region, wherein the barrier layers and/or the confinement layers are comprised of a material that reduces a level of non-confining valence band discontinuity in the quantum well due to the presence of nitrogen in the quantum well (col.25, l.66-67 and col.26, l.1-12). (Please note that the inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

With respect to claims 5 and 19, Jewell disclose the quantum well comprises > 1% N (col.27, 1.18).

With respect to claims 6-7, Jewell disclose the quantum well thickness is 50A (col.8, 1.29-30).

With respect to claim 14, Jewell disclose the quantum well is further comprised of Sb (col.7, 1.55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Reichert et al. (WO 01/52373 A2). Jewell disclose all limitations of the claims except for the GaAsN

barrier layers. Reichert teach the GaAsN barrier layers (abstract). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell the GaAsN barrier layers as taught by Reichert.

Claims 3-4, 9-13, 16-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Thornton (US6002705). Jewell disclose all limitations of the claims except for the AlGaAs confinement layers and the AlGaAs barrier layers. Thornton teach the AlGaAs confinement layers (col.5, 1.1-3) and the AlGaAs barrier layers (col.4, 1.63). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell AlGaAs barrier layers sandwiching the at least one quantum well and AlGaAs confinement layers sandwiching the active region as taught by Thornton.

Claims 21-25 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Thornton (US6002705).

With respect to claims 21-22, 24-25, and 28, Jewell disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (claim 1). Jewell lack AlGaAs barrier layers sandwiching the at least one quantum well and AlGaAs confinement layers sandwiching the active region. Thornton teaches AlGaAs barrier layers (col.4, l.62-63) sandwiching the at least one quantum well and AlGaAs confinement layers (col.5, l.1-3) sandwiching the active region. For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell AlGaAs barrier layers sandwiching the at least one quantum well and AlGaAs confinement layers sandwiching the active region as taught by Thornton. (Please note that the inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

With respect to claims 23 and 27, Jewell disclose the quantum well thickness is less than 80A that satisfies the claim limitation of 50A.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Thornton (US6002705) and further in view of Riechert et al. (WO 01/52373 A2). Jewell and Thornton disclose all limitations of the claim except for the InGaAsN barrier layers. Riechert teach the InGaAsN barrier layers (see Abstract). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell and Thornton the InGaAsN barrier layers as taught by Riechert.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Thornton (US6002705). Jewell disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (claim 1) and including InGaAs barrier layers (col.37, l.35) sandwiching the at least quantum well. Jewell lack the AlGaAs confinement layers. Thornton teach AlGaAs confinement layers sandwiching the active region (col.5, l.1-3). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell AlGaAs confinement layers sandwiching the active region as taught by Thornton. (Please note that the

inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riechert et al. (WO 01/52373 A2) in view of Dapkus (US6621842). Riechert disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (abstract) and including GaAsN barrier layers sandwiching the at least quantum well. Riechert lack the GaAsN confinement layers. Dapkus teach GaAsN confinement layers sandwiching the active region (col.6, l.1-3). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Riechert GaAsN confinement layers sandwiching the active region as taught by Dapkus. (Please note that the inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riechert et al. (WO 01/52373 A2) in view of Thornton (US6002705). Riechert disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (abstract) and including GaAsN barrier layers sandwiching the at least quantum well. Riechert lack the AlGaAs confinement layers. Thornton teach AlGaAs confinement layers sandwiching the active region (col.5, l.1-3). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Riechert AlGaAs confinement layers sandwiching the active region as taught by Thornton. (Please note that the inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell et al. (US6359920) in view of Thornton (US6002705) and further in view of Dapkus (US6621842). Jewell disclose a VCSEL comprising an active region further comprising at least one quantum well comprised of InGaAsN (claim 1).

Jewell lack AlGaAs barrier layers sandwiching the at least quantum well. Thornton teach AlGaAs confinement layers sandwiching the active region (col.5, 1.1-3). For the benefit of producing a proper active region of a VCSEL, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell AlGaAs confinement layers sandwiching the active region as taught by Thornton. However, Jewell and Thornton lack the GaAsN confinement layers. Dapkus teach GaAsN confinement layers sandwiching the active region (col.6, 1.1-3). For the benefit of producing a long and reliable wavelength VCSEL with stable performance, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Jewell and Thornton GaAsN confinement layers sandwiching the active region as taught by Dapkus. (Please note that the inherency to support the quantum well having a depth of at least 40 meV is the figure 14.3 of the book of Electronic Material Science: For Integrated Circuits in Si and GaAs by James W. Mayer and S.S. Lau).

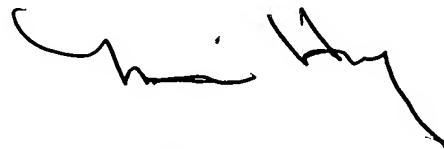
Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung (Michael) T Nguyen whose telephone number is (571) 272-1949. The examiner can normally be reached on 8:30 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.

Michael Dung Nguyen


MICHAEL DUNG NGUYEN
PRIMARY EXAMINER